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# ***Science and Technology Perspectives***

## **DEVELOPMENTS**

### **Semiconductors**

(South Korea) Development of a 4-megabit dynamic random access memory (4M DRAM) chip will begin in June with plans to begin manufacturing by mid-1989. The Korea Semiconductor Research Association reportedly organized three groups in April to concentrate on design and manufacturing, customized semiconductors for telecommunications, and industrial applications. Industry will invest 104.8 billion won through 1988, 69.8 billion of it for 4M DRAM design and manufacturing. (Seoul HANKUK KYONGJE SINMUN 24 Apr 86)

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## **FEATURE ARTICLES**

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A fire at the Microelectronics Enterprise (MEV) destroyed Hungary's largest and most technologically advanced chip production facility.

### **Japan: MITI Increasing Efforts to Create a Competitive Space Industry** ..... Page 5

In order to promote an internationally competitive space industry, Japan's Ministry of International Trade and Industry (MITI) plans to establish a new Space Committee within the Industrial Structure Council this fall.

### **USSR: Criticism of Patent Process** ..... Page 6

A prominent Soviet biomedical scientist decries the lengthy delays involved in the patent process.

### **USSR/Japan: Barrier to Computerization** ..... Page 7

The Soviets continue to stress the merits of adopting modern computer technology but are hindered in reaching their goals by a psychological barrier and a lack of personal computers. Japan may provide one million personal computers.

## **REPORTS**

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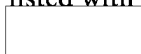
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PERSPECTIVES selections are based solely on foreign press, books and journals, or radio and television broadcasts. Some of the materials used in this publication will appear as abstracts or translations in the FBIS serial reports. Comments and queries regarding this publication may be directed to the Center Chief, to individuals at the numbers listed with items, or to the Science and Technology Center at



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**FOR OFFICIAL USE ONLY*****S&T DEVELOPMENTS:***

*DEVELOPMENTS highlights worldwide S&T events in the foreign media. Items followed by an asterisk will be published by FBIS. The contributor's name and telephone number are provided.*

<b>Femtosecond Laser</b>	(France) The Institute for Theoretical and Applied Optics in Orsay has developed a femtosecond ( $10^{-15}$ s) laser using soliton-like procedures. This discovery should lead to improvements in ultrashort laser pulse technology. (Paris LA RECHERCHE Jun 86) [REDACTED]	STAT
<b>64-Megabit Chip</b>	(W. Europe) Spokesmen for Philips, Siemens, and Thomson have confirmed that the three electronics firms are discussing the joint development of a 64-megabit chip. The question will be on the agenda of the London Eureka conference in late June 1986. (Rotterdam NRC HANDELSBLAD 10 Jun 86) [REDACTED]	STAT
<b>4-Megabit Chip</b>	(France/Italy) The French and Italian electronics firms, Thomson and SGS, are discussing plans to develop a 4-megabit chip. The 4-megabit chip will be the next generation to follow the current state-of-the-art 1-megabit device. (Rotterdam NRC HANDELSBLAD 10 Jun 86) [REDACTED]	STAT
<b>Armaments Industry</b>	(France) A bill has been introduced in the French National Assembly authorizing the return to the private sector of a sizable portion of the armaments industry. The bill will affect Pechiney, Thomson, Matra, Dassault, and most of the subsidiaries of Aerospatiale, SNECMA (including SEP), SNPE, and the French-owned portion of Arianespace. (Paris AIR & COSMOS 26 Apr 86)* [REDACTED]	STAT
<b>Factory Automation</b>	(France) Bull has spent 18 months and Fr 225 million constructing what it calls Europe's most modern plant for assembly of automated office equipment and work stations at Villeneuve-d'Ascq. Flexibility allows overnight conversion from assembly of one product to another. All phases are fully automated. (Paris LES ECHOS 27 May 86)* [REDACTED]	STAT
<b>Leclerc Tank</b>	(France) The new Leclerc Tank, whose mass production is scheduled to begin in late 1991, is described as an advanced attack tank with many innovations, including an automatic loader and onboard computers that govern engine performance, navigation, and weapons systems. Fr 35 billion will be invested in the new weapon, and the French Army will purchase 1,400 of them. (Paris L'USINE NOUVELLE 15 May 86)* [REDACTED]	STAT

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<b>Advanced Metals</b>	(Italy/PRC) The University of Trento in northern Italy and Beijing University have drafted a three-year convention calling for combined research into technologically advanced metals. The Trento University research team will take part in the convention drafted under the auspices of the European Community. (Rome ANSA 12 Apr 86) [REDACTED]	STAT
<b>Ariane</b>	(UK) Britain has switched the launch of its military satellite, Skynet 4-B, from the U.S. space shuttle to the Ariane rocket. Following the Challenger disaster, Arianespace announced eight extra launch slots for 1987 and 1988. Only four slots remain to be booked. Ariane may even launch Pentagon-owned satellites. (London FINANCIAL TIMES 28 May 86)* [REDACTED] [REDACTED]	STAT STAT
<b>Biotechnology</b>	(Japan) Nippon Roche, the Japanese subsidiary of the Swiss chemical company Hoffmann-La Roche, is one of two foreign companies selected by Japan to participate in a prestigious national research project in protein engineering. The other foreign partner is the U.S. Digital Equipment Corporation. The 10-year, 17 billion yen project will be 70 percent financed by MITI. (Bern AGENCE TELEGRAPHIQUE SUISSE 1 May 86)* [REDACTED] [REDACTED]	STAT SIAI
<b>"Zhi-8" Helicopter</b>	(PRC) The Changhe Aircraft Plant of the Ministry of Aviation Industry in conjunction with the China Helicopter Design Institute completed production of the "Zhi-8" heavy, multi-purpose helicopter on 11 December 1985. Initial test flights have been conducted at Jingdezhen, Jiangxi Province. Color glossies of the helicopter are available upon request. (Beijing HANGKONG ZHISHI May 86)* [REDACTED]	STAT
<b>Holography</b>	(USSR) After 10 years of unsuccessful scientific research in motion picture holography at the All-Union Institute for Scientific Research in Cinematography, at a cost exceeding 10 million rubles and with no end of expenditures in sight, the project continues to receive unlimited funds and approval from high-ranking officials and a monitoring commission. (Moscow MOSKOVSKAYA PRAVDA 19 Apr 86) [REDACTED]	STAT

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**HUNGARY: MICROELECTRONICS ENTERPRISE FIRE POSES SETBACK**

*Key Points: The damage by fire to Hungary's Microelectronics Enterprise (MEV) headquarters, which housed the "sophisticated" microchip production equipment purchased from the Soviet Union, was extensive.*

The fire occurred on 26 May and was reported in the press and by live radio coverage. In his comments to an on-the-scene reporter Deputy Minister of Industry Sandor Bognar stated that the damaged building was about 2,400 square meters in size and contained "very complex technological equipment, not much of which remains usable." Two Soviet-made production lines, each with an annual capacity of 10 million microelectronic parts, plus other Soviet equipment unavailable from the West because of embargoes, were evidently destroyed. Damage is presently assessed at about 1 billion forints (\$22 million).

MEV met 70 percent of the domestic demand for active elements — ICs, transistors, and diodes. This included sales to local companies and elements for barter with CEMA countries. If MEV could build a new plant in the coming Five-Year Plan as intended, HETIVILAGGAZDASAG contends that it would be able to satisfy 70 to 80 percent of the domestic demand. MEV director Bela Balogh stated in NEPSZABADSAG on 2 June that the firm's Seventh Five-Year Plan must stress renewed chip production by 1988. Failing this, the ability to meet demand would "plunge" to 20 percent. A new plant, however, is estimated to be one-and-a-half times more costly to build than the original facility.

Although the MEV fire caused grave damage to the electronics industry, Hungarian production of electronic equipment continues. ESTI HIRLAP reported on 28 May that seven state enterprises and six industrial cooperatives produce electronic parts worth 6.7 billion forints. Nearly 70 percent of these parts — valued at 4.6 billion forints — are built into Hungarian-made equipment.

Efforts are under way to alleviate the problems caused by the MEV fire. The Computer Technology Applications Enterprise (SZAMALK) has offered financial aid to MEV, MAGYAR HIRLAP reported on 29 May. The aid consists of 1 percent of SZAMALK profits (1 million forints) for immediate use by MEV plus \$50 million from the enterprise's foreign exchange fund. SZAMALK's commercial director argues that the aid is to his firm's advantage since a lack of ICs could put the costly computers which the enterprise services out of commission. He hopes other enterprises will follow SZAMALK's example. In addition to the damage to the electronics industry, the MEV disaster also threatens the Communication Engineering Cooperative because of the Cooperative's dependence on MEV for semfinished chips.

The EMO (Elektromodul, Hungarian Electrotechnical Parts Trading Enterprise) must acquire the parts to fill the market gap created by the MEV disaster. EMO's commercial director explained to MAGYAR HIRLAP that replacement of ICs is not a serious problem because "MEV had just begun producing them in series and only the quantity called for by MEV's production schedule" would have to be obtained. He contends that this should not be too difficult, since the Ministry of Foreign Trade is making convertible foreign exchange available. EMO initially will explore the purchase of semiconductors from Bloc countries. The commercial director noted, "I believe that the number of semiconductors which must be bought fully assembled will equal what MEV could have produced in two to four weeks."

The prospect of joint ventures with capitalist and socialist partners was reported by the Budapest Domestic Service on 28 May. Gyula Meszaros, representative of the Ministry of Industry, said during a press conference at the Budapest International Fair that Soviet-Hungarian and Western-Hungarian joint production ventures are in the offing. Both enterprises will manufacture semiconductors and chips. "If

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foreign partners, capitalist and socialist, with whom there was a traditional supply link, can provide the volume of chips lost due to the fire, then the MEV assembly and measurement plant can turn the chips into a finished product and there will be no loss to domestic industrial users or to export deliveries," the official stated.

(Sources cited in this article and Hungarian press reports updating the MEV crisis will appear in EUROPE REPORT: SCIENCE AND TECHNOLOGY.)



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**JAPAN: MITI INCREASING EFFORTS TO CREATE A COMPETITIVE SPACE INDUSTRY**

*Key Points: The Ministry of International Trade and Industry (MITI) plans to establish its new Space Committee this fall within the Industrial Structure Council. This council is one of MITI's most powerful deliberative organizations. The committee is to promote Japan's space technologies and, thus, a space industry that will be independent of the domestic aircraft industry and competitive with U.S. and West European space industries. The Space Committee will first promote an unmanned space lab program called the "Free Flyer."*

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The Tokyo press including NIKKAN KOGYO SHIMBUN of 7 and 17 April, reports that MITI has decided to establish this fall a Space Committee within the Industrial Structure Council in order to promote Japan's space industry. The committee would replace the present Space Industry Discussion Group, an advisory organization for the Director General of the Machinery and Information Industries Bureau, and would have greater influence over MITI's policy planning and decision-making processes.

NIKKAN KOGYO SHIMBUN reports that the first program the Space Committee is expected to promote is an unmanned space lab program called the "Free Flyer," which plans to examine whether or not the space environment can indeed support production in a weightless vacuum of new electronic and biotechnology products. MITI hopes to develop space colony and space factory projects based on the results of the space lab program. NIHON KEIZAI SHIMBUN reports on 14 and 17 May that MITI has allocated an FY86 budget of 80 million yen for the Free Flyer space lab program.

MITI also has established a nonprofit organization called the "Free Flyer System Research and Development Organization," headed by Mitsubishi Electric Chairman Nihachiro Katayama, to develop and construct the space lab by FY92. The organization is currently funded at 100 million yen and consists of 13 companies, including Mitsubishi Electric, Hitachi, NEC, Toshiba, Fujitsu, Mitsubishi Heavy Industries, Ishikawajima-Harima Heavy Industries, Kawasaki Heavy Industries, Sharp, Toshiba, and Nissan.

According to NIKKAN KOGYO SHIMBUN on 17 April, MITI's increased interest in space is warranted because the ministry expects that the international space market will grow rapidly and, by the 21st century, that market will be a \$30-40 billion business. The press indicates that Japan's space industry so far has been a subdivision of the aircraft industry and has concentrated only on development and production of artificial satellites and launch vehicles such as the H1 and H2 rockets. The press also says that Japan's space market remained at a meager 180 billion yen in FY84.

(A translation of the articles cited in this article will appear in JAPAN REPORT: SCIENCE AND TECHNOLOGY.)



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**FOR OFFICIAL USE ONLY****USSR: CRITICISM OF PATENT PROCESS**

*Key Points: The tortuous Soviet patent process, involving multiple steps, approvals, documentation, and delays, is described by a prominent Soviet biomedical scientist. He suggests that similar difficulties are encountered by Soviet inventors attempting to secure patents, and the monetary rewards for them, in many fields.*

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In a recent IZVESTIYA article, the renowned Soviet biomedical scientist and traumatologist G. Ilizarov discusses the extraordinarily long time required to bring scientific discoveries and inventions to practical application in society. Citing examples from his own institute, the Kurgan Scientific Research Institute of Experimental and Clinical Orthopedics and Traumatology, Ilizarov mentions one case in which it took 35 years for a scientific discovery to become a usable reality.

When researchers at Ilizarov's institute develop an original method of treatment or create a promising piece of equipment, the USSR State Committee for Inventions and Discoveries issues an author's certificate — an acknowledgement that the development is unique and of potential usefulness to society. The developer or inventor must acquire further testimonials and documentation. When these are all obtained, a favorable decision must be granted by the Administration for the Introduction of New Drugs and Medical Equipment, USSR Ministry of Health. (According to Ilizarov, those who judge the merits of an invention or development are often not competent to do so). The developer or inventor then must register the technical documentation; otherwise his contribution will be dormant. Approval of technical documentation involves a minimum of 10 stages and requires at least two years.

In criticizing the present process for evaluating the possible merits of an invention or development, Ilizarov declares that the "point" system of the All-Union Scientific Research Institute of Patent Information seriously impedes the efforts of medical inventors, since the authors of the system feel that the economic effect of a development or invention in medicine cannot be precisely determined. Ilizarov, however, cites several examples of new treatments for which a definite economic benefit can be calculated.

Ilizarov describes an example of egregious inefficiency. The Gudermes Plant for Medicinal Instruments, Minmedprom USSR, was charged in the early 1960s with the production of specialized instruments developed by Ilizarov's institute. By 1974, Ilizarov's institute had developed a modernized, refined set of these instruments. To produce the new set of instruments, the Gudermes Plant had only to make slight modifications in its setup. More than 10 years later these modifications have yet to be made. The Ministry of the Medical Industry has provided absolutely no help, Ilizarov states.

Even when inventions are brought into the economy, the inventors are often left with the problem of realizing the financial fruits of their labors. As an example, the scientific council at Ilizarov's institute is still trying to obtain monetary compensation from the USSR Ministry of Health for the authors of inventions that were introduced in 1974, 1976, and 1978, although in 1983 the Ministry of Health did request acknowledgement from the State Committee for Inventions and Discoveries that these developments had actually been introduced into practice.

Ilizarov recommends greater interdepartmental cooperation, for example, the creation of scientific-production associations. These could be formed between the Orthopedics and Traumatology Institute and other scientific-research therapeutic institutes. The study of traumatology, Ilizarov feels, should also be upgraded to the Academy level, since trauma is the second leading cause of death and incapacitation after cardiovascular disease. These steps would go a long way toward eliminating delay in the introduction of new techniques and instrumentation in traumatology and in medicine in general.

(A translation of the source article will appear in USSR: LIFE SCIENCES.)



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## USSR/JAPAN: BARRIER TO COMPUTERIZATION

*Key Points: The 27th CPSU Congress stressed the importance of modern computer technology. Key scientists and academicians, however, recognize that a psychological barrier and a shortage of computers in the classroom hinder the successful implementation of computerization in the Soviet Union. As a way of addressing the shortage, the Soviets have decided to import from Japan one million personal computers for computer education.*

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The 27th CPSU Congress stressed the special importance of the development and massive adoption of modern computer technology. Recent Soviet press reports indicate, however, that the Soviets are greatly concerned about the psychological barrier to computerization observed in Soviet workers. Nikolay Vasilyevich Gorshkov, head of the new USSR State Committee on Computer Technology and Information Science, stated in EKONOMICHESKAYA GAZETA on 18 April that the psychological barrier among managers of enterprises constitutes the greatest problem. Gorshkov says that many managers are simply afraid of new computer technology, are cautious with it, and just prefer to work "in the old way."

In a 20 April "Vremya" newscast interview, Guriy Marchuk, chairman of the State Committee for Science and Technology, also mentioned that in order to implement computerization successfully, the psychological barrier must be crossed. Marchuk said that only computer education could overcome the psychological barrier and produce broad developments in scientific and technical progress. Soviet concern about the psychological barrier to computerization has been so serious that research on the subject has developed into a new area of psychology referred to as "the psychology of computerization." The September All-Union conference at Moscow State University devoted a significant amount of time to this topic, according to VOPROSY FILOSOFII. The 300 participants at the conference included psychologists, philosophers, sociologists, economists, and computer specialists. The conference stressed the need to develop a psychological basis for the effective use of computer technology and the role of computers in man's intellectual development.

Gia Dvarmiya, director of the Computer Center for the Georgian Ministry of Education, pointed out in an article in ZARYA VOSTOKA on 6 February that the psychological barrier to computerization stems from a lack of interaction with computers and cited a serious shortage of computer equipment in classrooms and a dearth of trained personnel to operate and service such equipment.

In trying to cope with the psychological barrier and the lack of computers in classrooms, the Soviets have embarked on a course of importing as much computer equipment as possible. The leading Japanese economic journal, NIHON KEIZAI SHIMBUN, reported on 14 April that the Soviets have asked the Japanese to sell them more than one million 8-bit computers by 1990 and that this equipment would be used for computer education. Since the 8-bit computers are no longer restricted under COCOM regulations, U.S. and West European computer manufacturers are also making bids. So far, a small Japanese computer firm, Star Precision, has received a purchase order from the Soviets for 4,000 8-bit computers at a cost of 300 million yen.

(Translations of the Soviet sources cited in this article have been or are to be published in USSR: SCIENCE AND TECHNOLOGY POLICY.)



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## REPORTS:

*REPORTS surveys research trends in articles and books on a particular field of science and technology. It also includes summaries and listings of articles and books which may serve as potential sources for future research. Conference proceedings will also be occasionally presented in this section.*

## USSR: ARTICLES ON LASER REMOTE SENSING OF THE OCEAN SURVEYED

Recent articles in Soviet scientific journals indicate that Soviet scientists attach great importance to both the improvement of and the application of laser remote sensing methods. The observations reported in these publications demonstrate that much of their research has focused on laser remote sensing of the ocean (which has application to studies of water pollution, oil slicks, the distribution of organic matter, phytoplankton, temperature, bathymetry, turbidity, the surface expression of internal waves, and cartography). For example, the 1984 book "Noncontact Optical Methods of Research on the World Ocean" was devoted to the theoretical and experimental aspects of this subject. (1)

The Soviet development of a remote sensing apparatus incorporating a laser and a minicomputer was an extremely significant achievement. This equipment performed successfully from an AN-30 aircraft at altitudes of 800 to 1,200 meters and at speeds of 340 kilometers per hour. The design and operating parameters of the apparatus were published in detail in a November 1984 journal. The role of temperature-dependent bioluminescence as an interfering factor during attempts to measure sea-surface temperature via the Raman effect was also addressed in this investigation. (2)

The Soviets have continued to improve the application of laser remote sensing equipment to oceanographic research. They achieved a breakthrough by developing a new method for laser remote measurement of statistical wave characteristics. A description of this method, based on continuous sensing of the sea surface and recording of the returning reflected signal, and the following block diagram of the airborne laser sensor were published in April 1985. (3)

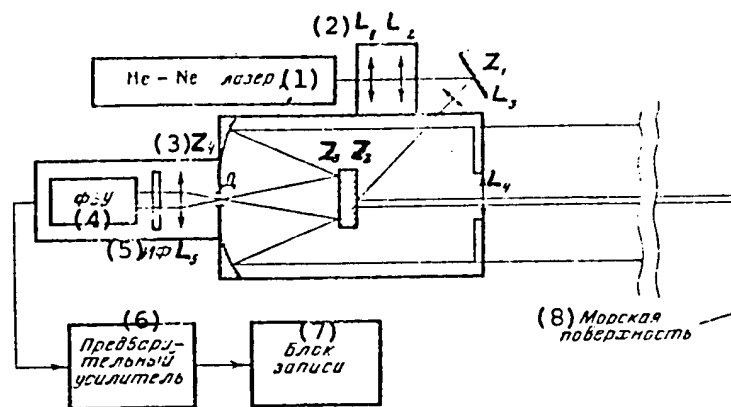


Figure 1. Block Diagram of Experimental Unit

## KEY:

- |                    |                        |
|--------------------|------------------------|
| 1. Laser           | 5. Interference filter |
| 2. Lens            | 6. Preamplifier        |
| 3. Mirror          | 7. Recording unit      |
| 4. Photomultiplier | 8. Sea surface         |

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In addition, over the past two years Soviet scientists have reported on the effect of fluorescence saturation on remote sensing of water media and on the statistical characteristics of phytoplankton concentration fluctuation and seawater optical properties in the field of long-period internal waves. They also reported on such related topics as the temperature dependence of the phytoplankton luminescence spectrum, the relationship between fluorescence intensity and the concentration of dissolved organic matter, NADH-dependent luminescence and the efficiency of luminescence systems in different marine bacteria species. (These articles have been discussed and cited in Foreign Press Notes FB PN 85-031 and FB PN 85-082.)

Two recent articles from D. V. Vlasov demonstrate continuing Soviet interest in this area. In August 1985 he co-authored a work which provides the results of numerical computations of the time structure of an echo signal in pulsed laser sensing of the upper layer of the ocean, taking into account the influence of large-scale surface waves. (4)

In an April 1986 article Vlasov says that the practicality of various types of measurements by airborne laser sensing methods is determined by the accuracy of measurement of the fluorescence cross section. He states that on all studied water areas the Soviet "Chaika" unit essentially registers with reliability the basic spectral components of the fluorescence of organic matter, of the signal of spontaneous Raman scattering of the molecular vibrations of water, of chlorophyll fluorescence, and of the radiation on the unbiased frequency corresponding to the Rayleigh-Mie scattering in the upper layer of the ocean. (5)

Further Soviet interest in this field is indicated by a review of the NATO book "Remote Sensing Applications in Marine Science and Technology," edited by A. P. Gracknell and published in 1983. Two Soviet reviewers state that this book gives a good survey of the basic results of space oceanography. (6)

The sources referred to above are as follows:

1. A complete translation of this book was published as USSR REPORT: EARTH SCIENCES, JPRS-UES-86-012-L, on 20 May 1986.
2. "A Universal Instrument Complex for Remote Laser Aerial Sounding of Ocean, Atmosphere, and Agricultural Crops" (ZHURNAL TEKHNIЧЕСКОГО ФИЗИКИ, November 1984)
3. "Aircraft Measurement of Sea Waves by Specular Reflection of a Continuous Laser Beam" (DOKLADY AKADEMII NAUK SSSR, Vol 281, No 6)
4. "Fluctuations in Echo Signal Intensity in Laser Sensing of the Ocean Upper Layer in the Presence of Large-Scale Surface Waves" (KVANTOVAYA ELEKTRONIKA, August 1985)
5. "Problems and Methods of Laser Remote Sensing of the Upper Layer of the Ocean" (IZVESTIYA AKADEMII NAUK SSSR: SERIYA FIZICHESKAYA, April 1986).
6. "Review of the Book: Remote Sensing Applications in Marine Science and Technology" (IZVESTIYA AKADEMII NAUK SSSR: FIZIKA ATMOSFERY I OKEANA, March 1986)

(Translations or abstracts of the above sources have appeared or will appear in USSR REPORT: EARTH SCIENCES.)



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**FOR OFFICIAL USE ONLY****USSR: RECENT SOVIET BOOKS (1984-86) DEALING WITH NUCLEAR POWER PLANTS**

Several new Soviet books dealing with the design, operation, and safety of nuclear reactors have been published. They are as follows:

**1. DESIGN OF BASIC EQUIPMENT IN NUCLEAR POWER PLANTS**

Schematic drawings are offered to show the design of the basic equipment used in domestic and foreign nuclear plants. Discussions also deal with heat exchange and the design of the main circulation pumps. (Moscow "Konstruirovaniye Osnovnogo Oborudovaniya AES" by V. A. Budov and V. A. Farafonov, in Russian 1985, 263 pp)

**2. HEAT RELEASE IN NUCLEAR REACTORS**

The book examines distribution of energy based on the fission reaction products, and offers effective methods for determining heat release in different components of the reactor. (Moscow "Teplovydeleniye v Yadernom Reaktore" by Ye. S. Glushkov, V. Ye. Demin et al., in Russian 1985, 160 pp)

**3. FUEL CYCLES AND PHYSICAL PROPERTIES OF HIGH-TEMPERATURE REACTORS**

The book presents the main issues related to the fuel cycles of high-temperature reactors which use helium as the heat transfer medium, and analyzes physical properties of high-temperature reactors with spherical fuel elements shifting in the core. (Moscow "Toplivnyye Tsikly i Fizicheskiye Osobennosti Vysokotemperaturnykh Reaktorov" by V. A. Karpov, in Russian 1985, 128 pp)

**4. NUCLEAR AND PHYSICAL METHODS IN DIAGNOSTICS AND CONTROL OF REACTOR CORES IN NUCLEAR POWER PLANTS**

The book examines the systems and means employed to control energy release and to examine neutron fields within channel-type reactors. Particular attention is devoted to the technical parameters of the reactors and their anomalous states. (Moscow "Yaderno-Fizicheskiye Metody Diagnostiki i Kontrolya Aktivnykh Zon Reaktorov AES" by S. S. Lomashkin, in Russian 1986, 120 pp)

**5. COLLECTION OF WORKS ON SAFETY STANDARDS IN NUCLEAR POWER PLANTS**

The book deals with welding and surfacing of components in nuclear power plants, research reactors, and other nuclear facilities. Discussions also relate to the required control of welded joints and surfaced components. (Moscow "Sbornik Normativnykh Materialov po Bezopasnosti AES" in Russian 1984, 144 pp)

**6. RADIOACTIVE DISCHARGES IN THE BIOSPHERE**

The book presents the methods, formulas, graphs, and tables indispensable for determining and evaluating the amount of radiation released into the atmosphere by nuclear power plants and other fuel cycle facilities and its effect on individuals and groups of the population. (Moscow "Radioaktivnyye Vybrosy v Biosfere — Spravochnik" by N. G. Gusev and V. A. Belyayev, in Russian 1986, 223 pp)

**7. THEORY AND METHODS OF ADAPTATION OF NUCLEAR ENERGY DEVICES**

The book deals with adaptability of nuclear plants to automated control, presenting the objectives and the theory of adaptation and offering approximate analytical methods of achieving the basic objectives. (Moscow "Teoriya i Metody Adaptatsii Atomnykh Energeticheskikh Ustanovok" by V. A. Yeremenko, in Russian 1985, 311 pp)

(Translations of the tables of contents, annotations, and introductions of the books cited above will appear in USSR REPORT: ENGINEERING AND EQUIPMENT.)



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## **USSR: RECENT SOVIET BOOKS (1985-86) ON RADAR AND SIGNAL PROCESSING**

Three books on radar and signal processing developments have recently been published. They are as follows:

### **1. THE RADAR SIGNATURE OF AIRCRAFT**

Methods for measuring the radar scatter and signature of aircraft are discussed. The material highlights the design and engineering of modern radar systems. (Moscow "Radiolokatsionnyye Kharakteristiki Letatelnykh Apparatov" by M. YE. Varganov, in Russian 1985, 236 pp)

### **2. DIGITAL SIGNAL PROCESSING**

Digital signal processing, an essential operation in complex systems such as communication networks and radars, is examined. (Moscow "Tsifrovaya Obrabotka Signalov" by L.M. Goldenberg, in Russian 1985, 312 pp)

### **3. MOVING TARGET INDICATION IN RADAR SYSTEMS**

Material on methods and equipment for moving target detection in radar systems is presented. (Moscow "Metody i Ustroystva Selektzii Dvizhushchikhesya Tseley" by P. A. Bakulev and V. M. Stepin, in Russian 1986, 286 pp)

(Translations of the tables of contents, annotations, and introductions of the books above will appear in USSR REPORT: ELECTRONICS & ELECTRICAL ENGINEERING.)



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## **ITALY/INTERNATIONAL: INFORMATION TECHNOLOGY INDUSTRY**

ASSINFORM, an association of Italian machine tool, office equipment, and information handling industries, in April 1986 published a 113-page report on developments in 1985 in the information technology industry.

The report is divided into two major sections dealing with the industry's informatics and telematics sectors. Both of these sections, in turn, examine economic and technological trends at the domestic and international levels. With regard to worldwide developments, the report compares the relative positions of Europe versus the United States and Japan, and of Italy with regard to Europe as a whole.

The report also devotes attention to cooperative efforts within the EEC and in Italy. In particular, the report discusses the Esprit and RACE programs in connection with the development of an integrated telecommunications system. The report also reviews Italy's national telecommunications program for 1985-1994.

ASSINFORM provides 38 tables, bar graphs, and pie charts to illustrate the above subjects and concludes its report with profiles of the 18 corporations comprising the association. These include both Italian firms and foreign subsidiaries such as IBM Italia, Honeywell, and Siemens. Each profile lists the company's capital stocks, revenues, and number of employees, and describes its chief markets, research efforts, and products.

In addition, ASSINFORM presents a four-page English-language summary of the report, which provides an overview of the information industry's economic achievements in 1985.

(Editorial highlights of the above will appear in EUROPE REPORT: SCIENCE AND TECHNOLOGY.)



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**PREVIEWS**

*S&T PREVIEWS is an annotated list of selected science and technology items being translated by FBIS. The list may also contain previously published items of wide consumer interest.*

**EUROPE REPORT: SCIENCE AND TECHNOLOGY**

**AEROSPACE**

**SURVEY OF ITALIAN AEROSPACE INDUSTRY PROGRAMS**

Aeritalia diversification; AMX program; Aeronavali aircraft conversion; RPV's; Alfa Romeo; FIAT Aviazione; Piaggio; Aeronautica Macchi; Agusta. (Paris AIR & COSMOS 19 Apr 86 various pages)

**VULCAN ENGINE IN DEFINITION PHASE AT SEP**

International contributions; timetable; costs; design. (Paris AIR & COSMOS 24 May 86 p 42)

**ADVANCED MATERIALS**

**INDUSTRIAL PROJECT FOR FRENCH HEAVY ION ACCELERATOR**

Construction of microporous membranes and filters, budgetary cuts threaten to close lab for two months this winter. (Paris L'USINE NOUVELLE 15 May 86 p 43, Paris LE MONDE 28 May 86 p 18).

**CIVIL AVIATION**

**THRUST REVERSER DOORS FOR SNECMA'S CFM56-5 ENGINE**

Composite materials description; weight savings of 20 percent; tests to begin. (Paris AIR & COSMOS 19 Apr 86 p 17)

**FRENCH FINANCING OF COMMERCIAL AIRCRAFT PROGRAMS DISCUSSED**

Current budgetary deficit; funding needs expected to increase; attempts at non-state financing. (Paris AIR & COSMOS 10 May 86 p 3)

**DEFENSE INDUSTRIES**

**FRANCE ANNOUNCES HELIOS MILITARY SPACE RECONNAISSANCE SYSTEM**

Aerospatiale to be prime contractor; uses same principle as Spot system; technologies, equipment described. (Paris LE FIGARO 16 Apr 86 p 12)

**MARCONI TO HAVE OVER-THE-HORIZON RADAR WITHIN TWO YEARS**

Under development since the 1960s; based on surface waves. (Paris AIR & COSMOS 17 May 86 p 24)

**UK'S EXPERIMENTAL AIRCRAFT PROGRAM DEMONSTRATOR SHOWCASES EUROPEAN CAPABILITY, COOPERATION**

CRT displays; holographic HUD; digital automatic flight controls; European, UK contributors; self-financing. (Paris AIR & COSMOS 3 May 86 pp 25-27)

**UK'S GEC INCREASES CAPITAL SHARE IN WESTLAND**

Participation now about 7 percent; Sikorsky, FIAT have named administrators. (Paris AIR & COSMOS 19 Apr 86 p 9)

**SERGE DASSAULT COMMENTS ON FRENCH PRIVATIZATION PLANS**

Changes in structure of capital; control of shares; plans of Dassault family reported. (Paris AIR & COSMOS 3 May 86 p 11)

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**USSR REPORT: EARTH SCIENCES**

**VISIBILITY IN OCEAN WATER AS INFLUENCED BY THE VERTICAL INHOMOGENEITY OF OPTICAL PROPERTIES**

The author calculates back-scattered radiation and contrast during submerged observations along a non-uniform path in both daylight and artificial illumination. (Moscow OKEANOLOGIYA Jan-Feb 86 pp 62-67)

**USSR REPORT: METEOROLOGY AND HYDROLOGY**

**ABNORMAL SEA ICE DRIFT SPEED IN ARCTIC SEAS**

Ice drift accelerates by a factor of 2 to 3 in Arctic straits, in most cases as the result of winds. However, rapid ice displacement is also caused by a compensatory current which is formed along shores as the result of surge. The rapid appearance and intensification of compensatory currents is a distinguishing characteristic of straits. (Moscow METEOROLOGIYA I GIDROLOGIYA No 1, Jan 86 pp 70-74)

**SPECTRAL ANALYSIS OF OCEAN-ATMOSPHERE ENERGY EXCHANGE CHARACTERISTICS**

Data from five North Atlantic geophysical observation stations reveal different time scales of intra-annual and interannual variability. (Moscow METEOROLOGIYA I GIDROLOGIYA No 2, Feb 86 pp 49-53)

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